

Virginia Gardening

with Jim May

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Conserving moisture in the summer is critical for plant survival

After an unusually dry spring, we are heading into the summer with a rain deficit in most areas of Virginia. The remnants of a tropical storm brought much-needed rain to many areas of the state in early June and thunderstorms pop up on warm afternoons, but that's not much to depend on for something so essential.

Annuals, perennials, lawns and other herbaceous plants show the effects of water stress quickly by wilting, but the effects of drought don't show up for several years in woody plants, like trees and shrubs. Water stress affects most of the physiological processes involved in plant growth. Under drought conditions, plants become more susceptible to disease and pest infestation. Water stress shows up as marginal leaf browning, leaf wilt, or poor leaf or bud formation.

You can bet that plants that have been mulched will show less effect from drought than plants with no mulch. A layer of organic mulch on flowerbeds and around the base of trees and shrubs helps conserve moisture and keeps down weeds, prevents soil compaction, moderates soil temperature and reduces erosion.

Trickle or drip irrigation is an effective method of watering not only vegetables, but also annuals, perennials, trees and shrubs. It applies water slowly and directly to the root zone through a plastic tube or soaker hose. This system saves from 30 to 70 percent of the water required by overhead sprinkler irrigation, since much of the water applied by sprinklers evaporates and is never used by plants.

Before you even plant a tree or shrub, you should plan ahead how you will water it. Will you use a soaker hose, a garden hose or have to haul water in buckets? Try to group your plants by water needs. The ones that need the most water in one area, the less thirsty ones in another area. Don't forget to mulch well.

When water is applied to the soil, it seeps down through the root zone very gradually. Plants need water at the root zone, not on their leaves. In a soil with no mulch cover, or on a windy day, much of this precious water is lost to evaporation. Each layer of the soil must be saturated before water will descend to the next layer. Once enough water is applied to move water to the root zone, moisture can be absorbed by plant roots and move up through the stem to the leaves and fruits. While growing, annual crops like vegetables and flowers need about 1 to 2 inches of water per week in the form of rainwater or irrigation water, depending on the type of soil.

All plants send out tiny feeder roots called root hairs in response to the presence of moisture. New root hairs are formed continuously as the roots extend into the soil. Most root hairs live and function for only a few days. Water travels from the roots to the leaves through a continuous system of “tubes” called the xylem. No matter how big the plant is it depends on these minuscule roots to transport the vast majority of its water and nutrient needs.

Many plants have an actively growing area of dividing cells located close to the surface called the cambium. In a tree, it is just under the bark. This thin living layer of cells divides constantly, creating new cells. The cambium layer is so thin that it is only one or two cells thick, yet so vital to the existence of a plant that if its continuity is broken, the plant can die.

Leaves have thousands of microscopic openings, called stomata, which have several very important functions. They allow carbon dioxide into the plant and oxygen to be released from the plant. Stomata also release water in a process called transpiration. They can only release what is available; after that they wilt in an effort to save precious moisture.

Obviously, trees and shrubs are not the only landscape plants affected by moisture stress. Flowerbeds and vegetable gardens can suffer greatly during a drought. Adequate soil moisture is essential for good crop growth. While growing, vegetable crops and flowers need about 1 to 2 inches of water per week in the form of rain or irrigation water depending on the type of soil. Water stress causes flowers and immature fruits to drop from plants, resulting in low yields. Tomatoes may develop blossom end rot, salad crops will be bitter and cucumbers will be small and misshapen. Watering the root zone and not the leaves can also reduce the chance of fungal problems on the leaves.

Afternoon shade and the use of windbreaks are other moisture-conserving techniques. Plants that wilt in very sunny areas can benefit from partial shade during the afternoon in summer. Young plants need the most protection. Air moving across a plant carries away the moisture on the leaf surfaces, causing the plant to need even more water. In very windy areas, the roots often cannot keep up with leaf demands, and plants wilt. Temporary or permanent windbreaks significantly reduce this stress.

We don't know what the rest of the summer will bring as far as rainfall goes, but conserving moisture by building healthy soil, using mulch and watering new plants is always a good idea, whatever the season.

Virginia Gardening with Jim May is brought to you by the Virginia Green Industry Council and the Virginia Department of Agriculture and Consumer Services.